

Practice Midterm 2
Economics 152
Professor: Philip Babcock

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Name _____
Student ID _____

There are 6 written problems on this exam, worth a total of 100 points. Please write neatly. If you place an answer to the question in an odd place, or on the back of the page, please indicate clearly.

Points will be deducted for any incorrect reasoning on a question, even if the correct answer to that question also appears. Correct guesses with incorrect reasoning earn no points.

Please show your work.

You have 75 minutes

1. Assorted short answers (5 points each)

a) Suppose a new law is passed that requires workers to retire early, at age 55. After the law is passed, do you expect more or fewer people to choose to get a college education? Explain. (Base your answer on human capital theory.)

b) Suppose demand for magazine subscriptions varies a lot from year to year. Would it be better to pay workers selling magazine subscriptions piece rates or to pay them based on tournament style competition? Explain.

c) How (as discussed in this course) might clever mobsters make sure that their new recruits are not FBI informants?

2. Human Capital

Suppose the interest rate, r , is 0%, the average person works for 40 years if they go to college and for 44 years if they don't. Tuition is \$10,000 a year for 4 years. The low-skill wage is **\$20,000**.

a) What is the expected lifetime earnings of a person who chooses not to get a college degree?

b) Congress decides that wage inequality is too high. A new law is passed requiring that college graduates be paid at most \$21,000 per year. What would be the result of this law? (Prove what you say with calculations.)

3. Signaling (5 points each)

a. Suppose there are two types of workers: high ability types and low ability types. Workers know their types but firms do not. Suppose firms require that workers wear uncomfortable stiletto heels to their job interviews in order to be paid the high wage. What crucial (and possibly questionable!) assumption about workers' utility must be true for the wearing of stiletto heels to be an effective signal of ability type?

b. Draw a diagram showing a signaling equilibrium where low ability types get 0 years of college and high ability types get s^* years of college. Label s^* . (Also, in the graph, we know that two distances must essentially be equal: Identify and label those distances.)

c. Suppose schooling is made much easier for low types and high types (in other words, suppose college is "dumbed down.") Draw a new graph showing the new equilibrium schooling s^* . Does s^* rise or fall?

4. Discrimination and wages

a) Is preference-based discrimination likely to occur in competitive markets? Explain why or why not.

b) A newspaper prints an article showing that even after controlling for education levels in a Oaxaca decomposition, there is still a large “unexplained” wage gap between beautiful people and plain (or aesthetically-challenged) people. The newspaper attributes this wage difference to discrimination. Give one reason why the newspaper might be **underestimating** the effects of discrimination.

c) Write down one distinctively white-sounding name and one distinctively African-American sounding name used by Bertrand and Mullanatahan in their audit study.

5. Promotions (5 points each)

You manage a basket-weaving factory. You are told to devise a tournament for your workers who weave wicker baskets. The quantity of baskets they weave is

$$q = m + e$$

where q is the number of baskets, m is effort, and e is a luck factor. The company sells baskets for **\$10 each**. There are two workers, j and k . Each worker experiences luck, e_j and e_k , respectively. $x = e_k - e_j$ takes on values between $-1/4$ and $1/4$ with a uniform probability distribution. (This means $g(x)$, the PDF of $e_k - e_j$, is equal to 2 at all points between $-1/4$ and $1/4$. In particular, it means $g(0)=2$.)

Worker utility is the expected value of the total wage earned minus effort squared:
 $E(\text{wage}) - 5m^2$. Thus $C(m) = 5m^2$.

This is a 1 period model: You announce that at the end of period 1, the worker who wove the most baskets will receive w_1 and the worker who lost will be paid w_2

a) We know that the expected wage of the worker in equilibrium is $(w_1 + w_2)/2$. The firm wants to choose w_1 and w_2 to elicit effort m so that $(w_1 + w_2)/2 = c(m)$.

Why does the firm **not** want to pick w_1 and w_2 so that $(w_1 + w_2)/2 < c(m)$?

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b) What is the optimal effort m^* the firm elicits from each worker

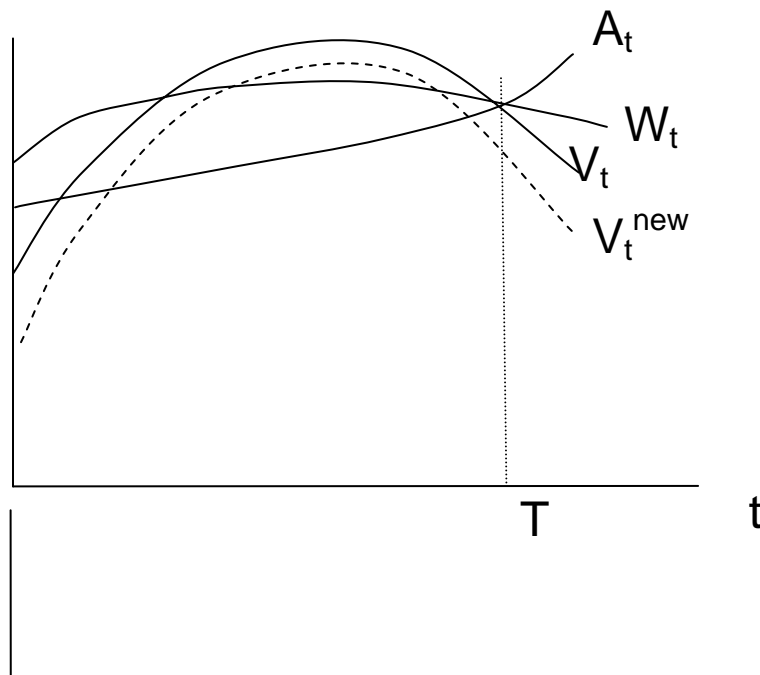
c) What are the optimal w_1 and w_2 ?

6. Layoffs and Buyouts (5 points each).

You are CEO of a firm that makes pacifiers for babies. Demand for pacifiers goes down because fewer people are having babies. This means you should lay-off some workers. Workers have varying years of service at your firm.

a) Mathematically, what is the condition under which a buyout of a worker of a given age (or seniority), t , is possible?

b) The graph below depicts the scenario described. Beneath this graph show the expected rents the firm gets from workers of ages (or seniorities) 0 to T , before and after the change in V_t



c) Suppose that V_t declines even more (demand for pacifiers goes way down). Suppose also that the outside option for workers of all ages rises. (Everyone enjoys their leisure more because there are fewer noisy, crying babies around!)

Describe or indicate which workers the firm is **able** to buy out after these changes.

